

REMARKS

Claim 17 has been amended. Claims 1, 3-5, 7, 8, 12-16, 18, 20, 21 and 23 have been canceled. New claims 24-28 have been added. Thus, claims 17, 22 and 24-28 are now pending in the present application. Support for the amendment to claim 17 may be found in original claims 18, 20 and 21, and in the specification at page 19, line 5. Support for new claims 24-28 may be found in original claims 12-16, respectively. Thus, no new matter has been added. Reconsideration and withdrawal of the present rejections in view of the comments presented herein are respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 1, 3-5, 7, 12-18 and 22 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fujishima et al. (US 6,239,231); and Claim 8 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fujishima et al. (US 6,239,231) in view of Nishimura et al. (US 2002/0009667); and claims 21 and 23 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fujishima et al. (US 6,239,231) in view of Hada et al. (WO 03/048863, wherein the citations are from the English equivalent US 2004/0058269). Claims 1, 3-5, 7 and 12-16 have been canceled, thus rendering the rejection moot as it applies to these claims. The rejections will be addressed as it relates to pending claims 17, 22 and 24-28.

None of the cited references teach or suggest the specific resin component (A) recited in claim 17 of the present application which comprises the structural units (a1), (a2), (a3), (a4) and (a5).

The Examiner dismissed Applicants' remarks in their previous response related to the unexpected results (reduced proximity effect without reducing depth of focus) obtained when structural units (a1), (a2), (a3) and (a4) are present in the claimed positive resist composition. In particular, the Examiner indicated at pages 15-16 of the Office Action that it was not possible to determine the effect of the presence of components (a4) or (a5) based on the data presented.

In order to address the concerns of the Examiner, enclosed herewith is a Declaration of Hideo Hada under 37 C.F.R. 1.132 which provides further evidence of the unexpected advantages obtained when structural units (a4) and (a5) as recited in present claim 17 are included in the positive resist composition. These results also illustrate the criticality of the molar percent range of the structural unit (a4) recited in present claim 17.

As described in the declaration at page 6, in Test Examples 1 to 4 in which a polymer containing all of the structural units (a1), (a2), (a3), (a4) and (a5) was used, and the amount of the structural unit (a4) was in the range of 5 to 50 mol%, excellent results were achieved, particularly in Test Examples 2 and 4, as compared to Comparative Test Examples 1 to 3. When the amount of the structural unit was the same as the lower limit of the range recited in present claim 17 (i.e., 5 mol%), excellent results could be achieved. In contrast, in Comparative Test Example 1 in which the polymer contained no structural unit (a4), a pattern could not be formed.

In Comparative Test Example 3 in which the polymer contained no structural unit (a5), the difference between the target size and the actual size was larger than those in Test Examples 1 to 4. In Comparative Test Example 2 in which the polymer contained all of the structural units (a1), (a2), (a3), (a4) and (a5), but the amount of the structural unit (a4) exceeded 50 mol%, the solubility of the polymer was so poor that the polymer could not be dissolved in the component (C).

These result support Applicants' contention that a resist composition containing a polymer which includes all of the structural units (a1), (a2), (a3), (a4) and (a5) exhibit unexpected, advantageous lithography properties over resist compositions containing a polymer which lacks the structural unit (a4) or the structural unit (a5). In addition, these results show that the molar percent range of the structural unit (a4) (5 to 50 mol%) recited in claim 17 is critical for achieving excellent lithography properties.

These unexpected results could not have been predicted by one having ordinary skill in the art, even in view of the cited references. Accordingly, the results strongly support the nonobviousness of the present claims.

In view of the amendments and comments provided above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a).

CONCLUSION

Applicants submit that all claims are in condition for allowance. Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

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